DIRECT TESTIMONY OF

GEORGE A. LIPPARD, III

ON BEHALF OF

DOMINION ENERGY SOUTH CAROLINA, INC.

DOCKET NO. 2022-2-E

Q. PLEASE STATE YOUR NAME, BUSINESS ADDRESS, AND POSITION WITHIN DOMINION ENERGY SOUTH CAROLINA, INC. ("DESC" OR "COMPANY").

A. My name is George A. Lippard, III. My business address is Post Office Box 88, Jenkinsville, South Carolina 29065. I am the Site Vice President of the Virgil C. Summer Nuclear Station ("VCSNS" or "V.C. Summer") for DESC.

Q. DESCRIBE YOUR EDUCATIONAL BACKGROUND AND YOUR BUSINESS EXPERIENCE.

A. I earned a Bachelor of Science degree in Mechanical Engineering from Clemson University in 1979 and a Master of Business Administration degree from the University of South Carolina in 1982. I joined DESC, then South Carolina Electric & Gas Company, in 1983 as a Nuclear Training Instructor at VCSNS. I received a Senior Reactor Operator Certification in 1986 and a Senior Reactor Operator License in 1992 from the United States Nuclear Regulatory Commission ("NRC"). Since joining the Company, I have held positions in the Operations,

Outage Management, Licensing, and Training organizations at V.C. Summer. I have also served in the leadership roles of Operations Manager and Plant General Manager at VCSNS. On January 30, 2016, I was promoted to Vice President of Nuclear Operations for Unit 1. As a result of the merger between Dominion Energy, Inc. and SCANA Corporation, my business title changed to Site Vice President of the VCSNS on January 1, 2019.

Q. WHAT IS THE PURPOSE OF YOUR TESTIMONY?

A. The purpose of my testimony is to provide the Public Service Commission of South Carolina ("Commission") with a review of the operating performance of VCSNS during the time period of January 1, 2021, through December 31, 2021 ("Review Period").

Q. WHAT ARE DESC'S OBJECTIVES IN THE OPERATION OF VCSNS?

A. DESC's primary objective at VCSNS is safe and efficient operation. The Company also strives for excellence in all phases of operation of the facility. The station's key focus areas of safety, reliability, outage and work management, work force development, and organizational effectiveness constitute the Company's core business plan elements. DESC's constant improvement in these areas over the years has facilitated VCSNS's outstanding service record. Furthermore, DESC's business objectives are focused on maintaining a competitive production cost for the generation of electricity using nuclear fuel.

Q. WHAT HAS BEEN THE COMPANY'S EXPERIENCE WITH THE PERFORMANCE OF THE VCSNS DURING THE REVIEW PERIOD?

A. VCSNS performed well during the Review Period. DESC continuously meets or exceeds all NRC requirements and Institute of Nuclear Power Operations ("INPO") standards. Consistent with the provisions of Section 58-27-865 of the South Carolina Code of Laws Annotated, as amended, V.C. Summer's net capacity factor based on reasonable excludable nuclear system reductions during the Review Period was 102.16%, and the gross generation output totaled 7,281,012 megawatt hours.

Q. PLEASE EXPLAIN THE ROLES OF THE INSTITUTE OF NUCLEAR POWER OPERATIONS ("INPO") AND THE UNITED STATES NUCLEAR REGULATORY COMMISSION ("NRC") WITHIN THE NUCLEAR INDUSTRY AND DESCRIBE ANY RANKINGS RECEIVED BY VCSNS FROM THOSE AGENCIES.

A. INPO is a nonprofit corporation established by the nuclear industry to promote the highest levels of nuclear safety and plant reliability. INPO promotes excellence in the industry in the operation of nuclear electric generating plants. For the Review Period, INPO rated VCSNS's overall performance as exemplary. An exemplary rating is the highest achievable rating from INPO.

The NRC is responsible for the licensing and oversight of the civilian use of nuclear materials in the United States. During the Review Period, the NRC reported

that VCSNS operated in a manner that preserved public health and safety and fully met all cornerstone objectives.

Q. DID VCSNS EXPERIENCE ANY UNPLANNED OUTAGES DURING THE REVIEW PERIOD?

A. Yes. During the Review Period, VCSNS experienced one mid-cycle unplanned maintenance outage in May 2021. More specifically, on May 12, 2021, at 6:37 p.m. the Company opened the main generator breaker and brought VCSNS offline to safely repair a valve actuator air leak on its safety-related, non-radioactive Loop "B" Main Feedwater Isolation Valve. DESC experienced a similar repair to its Loop "A" Main Feedwater Isolation Valve in September 2020, and had been monitoring the Loop "B" Main Feedwater Isolation Value under the plant's trending program. In May 2021, the air leak reached the point where its repair became necessary. Due to the function of the valve, the Company was required to take the plant off-line to implement the repairs and perform post-maintenance testing. The valve actuator was repaired and tested, and the outage ended with the closure of the generator breaker on May 15, 2021, at 3:29 a.m. In light of the Company's recent experience with these components, DESC intends to replace them during VCSNS's next refueling outage.

Q. DID VCSNS EXPERIENCE ANY PLANNED OUTAGES DURING THE REVIEW PERIOD?

A. Yes. During the Review Period, VCSNS experienced one planned outage. On October 8, 2021, the unit began to reduce its generation output in a controlled manner, and the generator output breaker was opened at 11:48 p.m. that same day to conduct V.C. Summer's 26th scheduled refueling outage ("RF26").

Q. HOW LONG DID RF26 LAST?

A. RF26 lasted approximately 36½ days during which time the Company met all technical objectives and completed scheduled maintenance activities. The reactor returned to criticality at 3:43 p.m. on November 13, 2021, and the outage ended with the closure of the generator output breaker at 11:41 a.m. on November 14, 2021. The outage was completed with no nuclear safety significant events.

Q. PLEASE EXPLAIN THE KEY MAINTENANCE AND MODIFICATION TASKS DESC ACCOMPLISHED DURING RF26.

A. During the refueling outage, approximately one-third of V.C. Summer's 157 fuel assemblies were replaced, and scheduled maintenance work that cannot be performed when the plant is in operation was conducted. During this time, over 6,000 tasks including preventative maintenance, corrective maintenance, plant modification, and surveillance testing tasks were completed successfully. DESC completed several key maintenance and modification tasks during RF26, a few of

which are described below.

- **Reactor Vessel 10-year Inservice Inspection and Materials Reliability Program Inspections.** The reactor vessel's core barrel was removed and subsequently reinstalled to allow for robotic inspections on the reactor vessel and various other components such as baffle bolts and control rod guide cards.

- **Service Water Piping Replacement.** V.C. Summer utilizes water from Lake Monticello to provide cooling to various heat loads. This system is known as service water. Several sections of piping that were susceptible to cavitation induced erosion were replaced with more robust stainless-steel piping and valves which reduced the potential for cavitation. The replacement of this piping and these valves completes a strategy which began in the previous refueling outage, namely, Refueling Outage No. 25.

- **"C" Reactor Coolant Pump Seal Replacement.** The seal package on the "C" reactor coolant pump was proactively replaced to address a minor imbalance in differential pressure across the three stages of the seal package.

Q. AFTER VCSNS COMPLETED ITS REFUELING OUTAGE DID THE UNIT EXPERIENCE ANY OUTAGES?

A. Yes. As I testified earlier, VCSNS completed its outage on November 14, 2021, and while the Unit was in the process of returning to full power, the main generator step-up transformer ("GSU") experienced a significant failure at 5:28 p.m. on November 15, 2021. This resulted in an automatic turbine trip followed by a manual reactor trip thereby interrupting VCSNS's planned return to service. The plant trip response was normal.

Q. WHAT IS A GSU?

A. A GSU is a large, custom built piece of equipment that is critical to the bulk transmission grid. A GSU is a critical component of the transmission system because it adjusts the electric voltage to a suitable level on each segment of the power transmission from generation to the end user. In other words, the GSU increases the plant's generator voltage for efficient, long-haul transmission of electricity. The voltage is then decreased at another point on the electric system for distribution to the level used by customers.

Q. DID DESC INVESTIGATE THE CAUSE OF THE GSU FAILURE?

A. Yes. DESC's investigation of this matter revealed that the fault resulted from a failure of the transformer's center phase high side (230 kilovolt) bushing. The original equipment manufacturer, Mitsubishi, also conducted an evaluation which

confirmed DESC's assessment that the fault had caused damage to such a degree that the GSU could not be repaired.

Q. WHAT STEPS DID DESC TAKE TO RETURN VCSNS TO SERVICE?

A. As I testified earlier, a GSU is very large piece of equipment. Additionally, it consists of two main active parts: the core, which is made of high-permeability, grain-oriented, silicon electrical steel, layered in pieces; and windings, which are made of copper conductors wound around the core, providing electrical input and output. All told, DESC's GSU weighs approximately one million pounds.

After the incident, work began to partially disassemble the GSU's auxiliary systems to prepare it for removal from its pad mounted location so that DESC's spare GSU could be put in its place. While DESC was partially disassembling the GSU, DESC also prepared VCSNS's spare GSU so that it could be moved into the transformer yard for reinstallation. DESC's spare GSU served as VCSNS's previous GSU, which had been removed from service in 2009, but had been kept in inventory as a spare and maintained ready for service, if needed.

Q. WHEN DID VCSNS RETURN TO SERVICE?

A. VCSNS was off-line for approximately 25 days returning to service on December 10, 2021, with the closing of the main generator breaker at 7:48 p.m.

Q. WHAT PLANS, IF ANY, DOES THE COMPANY HAVE REGARDING THE PROCUREMENT OF ANOTHER GSU?

A. DESC is working to provide design specifications to procure a new GSU which will be placed in service in a future refueling outage. Procurement and manufacturing of a large GSU is a complex and time-consuming process. As a result, the procurement of a new GSU is considered a long-lead item which will take approximately two years to procure. The Company anticipates installing a new GSU in the Fall of 2024 and will likely return the existing GSU to inventory as a spare to be called upon if needed.

Q. WHEN WILL THE NEXT REFUELING OUTAGE OCCUR?

A. DESC's next refueling outage, Refueling Outage No. 27 ("RF27"), is scheduled for Spring 2023. Refueling outages are scheduled every 18 months to replace depleted fuel assemblies. Maintenance and testing that cannot be done with the plant on-line are also conducted during the refueling outage.

Q. WHAT IS THE USED FUEL STORAGE CAPABILITY FOR VCSNS?

A. V.C. Summer's used fuel storage capability consists of a spent fuel pool, which is equipped with storage racks designed to hold fuel assemblies removed from the reactor, and a dry cask storage facility, which was placed in service in January 2016. Together, DESC's fuel storage capability has been designed to accommodate storage of all fuel used for the life of the plant. The Company last

transferred used fuel from the spent fuel pool to the dry cask storage facility in Spring 2019. The next such transfer is scheduled to occur in March 2022.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes.